initiated complementary chain synthesis from F1 is displaced. As a result, the complementary chain synthesized with itself as the template is made ready for base pairing again at the 3'-terminal. This 3'-terminal is provided with a region R1 capable of annealing to R1c in the same chain, and the two are annealed preferentially due to the rapid intramolecular reaction (i.e., forming a third loop). The same reaction as the above-described reaction starting from the 3'-terminal synthesized with FA as a template proceeds in this region as well. As a result, the nucleic acid having complementary nucleotide sequences linked alternately in the same single-stranded chain according to the present invention is continued to be extended from R1 as the starting point at the 3'-terminal by successive synthesis of a complementary chain and subsequent displacement thereof. Because R2c is always contained in the loop formed by intramolecular annealing of the 3'-terminal R1, the oligonucleotide (RA) provided with R2 anneals to the loop at the 3'-terminal in the subsequent reaction.

When attention is paid to nucleic acid synthesized as complementary chain from the oligonucleotide annealing to the loop in the single-stranded nucleic acid elongated with itself as the template, synthesis of the nucleic acid having complementary nucleotide sequences linked alternately in the same single-stranded chain according to the present invention also proceeds here. That is, synthesis of a complementary chain from the loop (i.e., the first loop) is completed when it reached RA in e.g. Fig. 2-(7). Then, when the nucleic acid displaced by this nucleic acid synthesis (i.e., forming the third loop) initiates synthesis of complementary chain (Fig. 3-(8)), the reaction reaches the loop which was once the origin of synthesis (i.e., the first loop), and displacement is initiated again. In this manner, the nucleic acid initiated to be synthesized from the loop is also displaced, and as a result, the 3'-terminal R1 capable of annealing in the same chain is obtained (Fig. 3-(10)). This 3'-terminal R1 anneals to R1c in the same chain to initiate synthesis of complementary chain. This reaction is the same as in Fig. 2-(7) except that F is used in place of R. Accordingly, the structure shown in Fig. 3-(10) can function as a new nucleic acid which continues self-elongation and new nucleic acid formation.